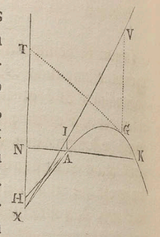
De Motu Corporum

& propterea etiam æqualis KN. Sed CE eſt ad AE ut FH ad KN, & propterea CE & FH æquantur. Incidit ergo punctum H in hyperbolam aſymptotis AK, KF deſcriptam, cujus conjugata tranſit per punctum C, atque ideo reperitur in communi interſectione hyperbolæ hujus & circuli deſcripti. *Q. E. D.* Notandum eſt autem quod hæc operatio perinde ſe habet, ſive recta AKN horizonti parallela ſit, ſive ad horizontem in angulo quovis inclinata: quodque ex duabus interſectionibus H, H duo prodeunt anguli NAH, NAH; & quod in praxi mechanica ſufficit circulum ſemel deſcribere, deinde regulam interminatam CH ita applicare ad punctum C, ut ejus pars FH, circulo & rectæ FK interjecta, æqualis ſit ejus parti CE inter punctum C & rectam AK ſitæ.

Quæ de hyperbolis dicta ſunt facile applicantur ad parabolas. Nam ſi $XAGK$ parabolam deſignet quam recta XV tangat in vertice X, ſintque ordinatim applicatæ IA, VG ut quælibet abſciſſarum XI, XV dignitates XI^n, XV^n; agantur XT, GT, AH, quarum XT parallela ſit VG, & GT, AH parabolam tangant in G & A: & corpus de loco quovis A, ſecundum rectam AH productam, juſta cum velocitate projectum, deſcribet hanc parabolam, ſi modo denſitas medii, in locis ſingulis G, ſit reciproce ut tangens GT. Velocitas autem in G ea erit quacum projectile pergeret, in ſpatio non reſiſtente, in parabola conica verticem G, diametrum VG deorſum productam, & latus rectum $\frac{2GTq}{nn-n \times VG}$ habente. Et reſiſtentia in G erit ad vim gravitatis ut GT ad $\frac{2nn-2n}{n-2} VG$. Unde ſi NAK lineam horizontalem deſignet, & manente tum denſitate medii in A, tum velocitate quacum corpus projicitur, mutetur utcunque angulus NAH; manebunt longitudines AH, AI, HX, & inde datur parabolæ vertex X, & poſitio rectæ XI, & ſumendo VG ad IA ut XV^n ad XI^n, dantur omnia parabolæ puncta G, per quæ projectile tranſibit.



SECTIO

Liber. Secundus.

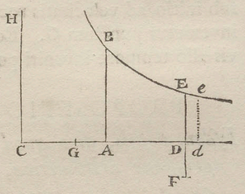
SECTIO III.

De motu corporum quibus reſiſtitur partim in ratione velocitatis, partim in ejuſdem ratione duplicata.

PROPOSITIO XI. THEOREMA VIII.

Si corpori reſiſtitur partim in ratione velocitatis, partim in velocitatis ratione duplicata, & idem ſola vi inſita in medio ſimilari movetur: ſumantur autem tempora in progreſſione arithmetica; quantitates velocitatibus reciproce proportionales, data quadam quantitate auctæ, erunt in progreſſione geometrica.

Centro C, aſymptotis rectangulis $CAD\,d$ & CH, deſcribatur hyperbola BEe, & aſymptoto CH parallelæ ſint AB, $\mathcal{D}E$, de. In aſymptoto CD dentur puncta A, G: Et ſi tempus exponatur per aream hyperbolicam $ABE\mathcal{D}$ uniformiter creſcentem; dico quod velocitas exponi poteſt per longitudinem $\mathcal{D}F$, cujus reciproca $G\mathcal{D}$ una cum data CG componat longitudinem $C\mathcal{D}$ in progreſſione geometrica creſcentem.



Sit enim areola $\mathcal{D}E\,e\,d$ datum temporis incrementum quam minimum, & erit $\mathcal{D}\,d$ reciproce ut $\mathcal{D}E$, ideoque directe ut $C\mathcal{D}$. Ipſius autem $\frac{1}{G\mathcal{D}}$ decrementum, quod (per hujus lem. 11.) eſt $\frac{\mathcal{D}\,d}{G\mathcal{D}q}$, erit ut $\frac{C\mathcal{D}}{G\mathcal{D}q}$ ſeu $\frac{CG+G\mathcal{D}}{G\mathcal{D}q}$, id eſt, ut $\frac{1}{G\mathcal{D}} + \frac{CG}{G\mathcal{D}q}$. Igitur tempore $ABE\mathcal{D}$ per additionem datarum particularum $E\mathcal{D}de$ uniformiter creſcente, decreſcit $\frac{1}{G\mathcal{D}}$ in eadem ratione cum velocitate. Nam decrementum velocitatis eſt ut reſiſtentia, hoc

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